

REMARKS

The Office Action mailed September 24, 2001, has been carefully reviewed and considered. Claims 7-15 and 21-24 were pending in the present application. By way of this amendment and reply, claims 7 and 21-24 have been amended. No new matter has been introduced and no new issues are raised. Accordingly, claims 7-15 and 21-24 remain pending for reconsideration.

In the Office Action, claims 7-15 and 21-24 were rejected under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 5,511,156 to Nagasaka. In view of the amendments to the claims, and for at least the reasons set forth herein, this rejection is respectfully overcome.

The inventor would like to emphasize that the bands obtained by dividing a page of print data from the top (or in the printing direction) are transferred sequentially in the printing direction to available expanders. More specifically, when a band has been expanded into bit-map data, the subsequent band is selected and transferred to an available one of the expanders. In other words, according to the present invention, the print server computer and the client computers perform expanding band data in parallel in the direction from the top of a page or in the printing direction. This is reflected in the claims of the present application.

In a distributed system, since there may be differences in processing speed among the client computers and the print server computer, the print server computer does not always receive bit-map data of bands in original sequence. In the print server computer, therefore, the received bit-map data of a band is stored in a bit-map data buffer to rearrange the bit-map data of bands in original sequence. However, according to the present invention, since the bands are expanded in parallel by the client computers and the print server computer in the direction from the top of a page or in the printing direction, there is a very good likelihood that the bands are expanded in the original sequence, resulting in extremely simplified rearranging operation (see e.g. step S407 of Fig. 4) and therefore a high speed printing operation and a reduced amount of buffer memory.

In the cited reference (Nagasaka), the intermediate code file is divided into a plurality of partial files. In Fig. 27, especially, a printable area is divided into a plurality

of oblong areas. However, Nagasaka teaches only group discrimination such that the overlap between two graphic form elements is detected to determine these elements as the same graphic form group (col. 22, line 40 through col. 23 line 42). Nagasaka does not teach how the divided oblong areas are expanded in the system to obtain high printing speed. Accordingly, there is a low probability that the divided oblong areas are expanded in the original sequence, which may result in a significant rearranging operation and therefore low speed printing operation and an increased amount of buffer memory.

The claims have been amended, where necessary, to make this distinction more clear. No new issues are raised, however, by such amendments. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(b) is requested.

Applicant respectfully submits that the claims are now in condition for allowance and solicits early notification of the same. Should there be any questions or concerns regarding the present application, the Examiner is invited to contact Applicant's undersigned representative by telephone.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

7. (Twice Amended) A network system composed of a print server computer and a plurality of client computers, wherein each of the print server computers and the plurality of client computers has a print data expander for expanding print data to bit-map data in parallel, wherein

each of the plurality of client computers comprises:

a page divider for dividing generated print data for each page into a plurality of bands, wherein the generated print data is generated by an application; and

a transfer controller for transferring a sequentially selected one of the bands to an available one of print data expanders of the print server computer and other client computers, wherein expanded bit-map band data by the print data expander of each client computer is transferred to the print server computer, and

the print server computer comprises:

a combiner for combining bit-map band data expanded by the print data expander of the print server computer and the expanded bit-map band data received from at least one of the client computers to produce bit-map data corresponding to the generated print data.

21. (Amended) A network system [composed of] comprising a print server computer [comprising] and a plurality of client computers, wherein each of the plurality of client computers comprises:

a first print data expander for expanding print data to bit-map data;

a page divider for dividing generated print data for each page into a plurality of bands, wherein the generated print data is generated by an application; and

a transfer controller for transferring a sequentially selected one of the bands to an available one of print data expanders of the print server computer and other client computers, wherein expanded bit-map band data by the print data expander of each client computer is transferred to the print server computer,

the print server computer comprising:

a second print data expander for expanding print data received from at least one of the client computers to bit-map band data in parallel with said first print data expander;

a combiner for combining bit-map band data expanded by the print data expander of the print server computer and the expanded bit-map band data received from at least one of the client computers to produce bit-map data corresponding to the generated print data.

22. (Amended) A client computer in a network system [composed of a client computer] comprising [of] a print server computer and a plurality of client computers, said client computer comprising:

a print data expander for expanding print data to bit-map data;

a page divider for dividing generated print data for each page into a plurality of bands, wherein the generated print data is generated by an application; and

a transfer controller for transferring a sequentially selected one of the bands to an available one of print data expanders of the print server computer and other client computers, wherein expanded bit-map band data by the print data expander of the client computer is transferred to the print server computer,

wherein the print server computer combines bit-map band data expanded by the printer server computer and the expanded bit-map band data received from at least one of the client computers to produce bit-map data corresponding to the generated print data.

23. (Amended) A network system [composed of] comprising a plurality of client computers [comprising of] and a server program for instructing a print server computer, wherein each of the plurality of client computers comprises:

a first print data expander for expanding print data to bit-map data;

a page divider for dividing generated print data for each page into a plurality of bands, wherein the generated print data is generated by an application; and

a transfer controller for transferring a sequentially selected one of the bands to an available one of print data expanders of the print server computer and other client computers, wherein expanded bit-map band data by the print data expander of each client computer is transferred to the print server computer, and wherein

the server program [comprising] comprises the steps of:

expanding print data received from at least one of the client computers to bit-map band data in parallel with said first print data expander;

combining bit-map band data expanded by the print data expander of the print server computer and the expanded bit-map band data received from at least one of the client computers to produce bit-map data corresponding to the generated print data.

24. (Amended) A network system [composed of] comprising a print server computer, [and] a plurality of client computers [comprising of] and a client program for instructing a client computer, [wherein the] said program comprising the steps of:

expanding print data to bit-map data;

dividing generated print data for each page into a plurality of bands, wherein the generated print data is generated by an application; and

transferring a sequentially selected one of the bands to an available one of print data expanders of the print server computer and other client computers, wherein expanded bit-map band data by the print data expander of each client computer is transferred to the print server computer.